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ABSTRACT

Two infant stimulation programs - for Down's Syndrome and hearing impaired children - in Montgomery County, Maryland, are described. Referral, initial assessment, development of individualized education program, and use of learning activities with the Down's infants are discussed along with intervention rationale, parent role, and child development stages (gross motor, fine motor, communication, social and self help). The hearing impaired program description focuses on accompanying handicaps, conductive and sensorineural losses, audiological evaluation techniques, hearing aid selection and use, auditory training, and specific skill development. (CL)

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EARLY STIMULATION PROGRAMS FOR HANDICAPPED CHILDREN IN THE MONTGOMERY COUNTY, MARYLAND (USA) PUBLIC SCHOOL SYSTEM: DOWN'S SYNDROME AND AUDITORY IMPAIRMENTS

By

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EARLY STIMULATION PROGRAMS FOR HANDICAPPED CHILDREN IN THE MONTGOMERY COUNTY, MARYLAND (USA) PUBLIC SCHOOL SYSTEM: DOWN'S SYNDROME AND AUDITORY IMPAIRMENTS

Montgomery County Public Schools (MCPS) is a large public school system located in the State of Maryland on the outskirts of Washington, D.C. (USA). Currently, the school system consists of 188 schools, of which 127 are elementary (grades 1-6), four are middle schools (grades 6-8), 27 are junior high schools (grades 7 and 8), and 21 are high schools (grades 9-12). There also are nine special schools for moderately and severely handicapped children which generally are non-graded.

Of the 107,000 students in the school system, about 9,600 are categorized as handicapped students (i.e., mentally retarded, emotionally disturbed, visually impaired, hearing impaired, orthopedically handicapped, speech or language impaired, multiply handicapped, or other health impairment), and are receiving special services. Of this number, approximately 8,000 are served in a regular school setting and 1,200 students are served in special schools. An additional 400 students (usually very severely handicapped) are served in private day or residential facilities, for which the public school system pays the cost. As these numbers indicate, it is the philosophy of MCPS that, to the extent possible, handicapped students should be educated with their non-handicapped peers and in as normal an environment as possible.

MCPS also conducts a number of "preschool" programs for students younger than six years of age. These programs serve approximately 1,000 children from birth through five years of age: 800 three, four, and five-year old economically disadvantaged children, and 200 physically and/or mentally handicapped children. Of the 200 physically and mentally handicapped preschool children currently served, about 60 are younger than two years of age.

Although Montgomery County Public Schools has provided programs both for handicapped and non-handicapped preschool children for the last eight years, these efforts have received a great deal of attention recently because of new federal and state legislation dealing with the civil rights of handicapped children. The most important such law to be enacted in the United States recently is the Education of All Handicapped Children Act (Public Law 94-142) which was signed into law by President Ford in 1975, and which took effect in 1977. This law guarantees a "free, appropriate public education" for all handicapped children in the USA from the ages of three years to 21 years. The State of Maryland subsequently passed a law extending this right to all handicapped children in Maryland between the ages of birth and 21 years. While the State of Maryland's law regarding educational services to handicapped children from birth

does not take effect until 1981, most local school systems in Maryland are preparing for such programs now.

MCPS has conducted infant stimulation programs, on a limited basis, for eight years. Classes for developmentally delayed and multiply-handicapped infants, birth to two years old, and their parents, have been operating for the last five years; and classes for visually and auditorilly-impaired infants and their parents have been running for the last seven and eight years respectively. This paper will describe two of these programs.

DOWN'S SYNDROME

In Montgomery County, infants diagnosed as exhibiting Down's Syndrome are treated together with infants diagnosed as having other developmental delays or disabilities, such as brain damage, failure to thrive, and delays subsequent to prematurity. In addition to the Public School System's Parent-Infant Early Intervention Program, which serves 24 children, there are at present three non-public programs, partially funded, however, by Montgomery County Public Schools (MCPS), which provide services to approximately 50 developmentally delayed or disabled infants under the age of two years. Although each is administered by a different agency, all of these programs share somewhat common philosophies, goals, and methodologies.

The goals of the MCPS Parent-Infant Early Intervention Program are:

1. To assist parents in coping with the long and short-term problems associated with having a handicapped child as a family member.
2. To maximize each child's potential to learn and develop by formulating and implementing an individualized educational/therapeutic program for each infant.
3. To provide parents with the necessary skills to continue at home the educational/therapeutic process initiated in the school.

About thirty percent of the infants in the program are Down's Syndrome. All of the children meet two mornings a week in a small group (usually no more than six children at one time) with an interdisciplinary staff, including two infant development specialists (educators), a physical therapist, a speech clinician, and a parent counselor. The services of a psychologist and pediatrician also are available to infants and parents on a consulting basis.

After referral, usually by hospital, physician, or the public health department, initial contact is made with the family through a home visit where intake information is acquired and a preliminary assessment of present levels and styles of functioning is made. A review of medical and of any previous neurological, psychological, and educational records, plus personal

contact with the professionals already servicing the family serves as the basis for developing an individualized educational program (IEP) for each child.

The major determiner of the individualized educational program, however, is an assessment of each infant's developmental levels. This assessment is repeated bimonthly and provides a systematic means of evaluating a child's skills, selecting appropriate objectives for treatment of developmental delays, and designing an appropriate curriculum based on a developmental model.

Programming specifically planned for each child includes the following areas: sensory stimulation, gross and fine motor development, language development, cognitive development, social development, and skills for daily living.

Activities designed to stimulate the infant's growth and development in each of these areas are demonstrated at the two sessions each week which parents attend with their child, so that they can carry them on with the child at home. Home visits to check on the home environment and on how well the parents are carrying out the stimulation activities are made once or twice each month as needed.

Although their progress is slower than a normal child's, our experience with the Down's Syndrome infants in this program is that with early stimulation, the potential of most of the children to learn and develop can be maximized in most developmental areas. Where associated health problems have been so severe as to limit the child's ability to participate fully in the stimulation activities, however, developmental skills progress has not been as good. With early and appropriate intervention, most Down's Syndrome children have the potential to be successful in a public school special education program, and to ultimately work and support themselves and never throughout their lives be considered severely retarded. Certainly these Down's Syndrome infants receiving stimulation achieve developmental milestones earlier than those Down's infants who receive no such training. These observations have been borne out by Hanson, VanderVeer, Zausmer, Pueschel, Barnard, Drezek, and Rynders (1, 2, 3, 4, 5, 6, 7). More observation and research of a systematic nature, of course, will need to occur if this assumption is to receive widespread professional acceptance.

In this connection, it is interesting to note that as recently as 1960, Benda stated that with mongoloid children, therapy -- no matter how soon instigated after birth -- is still rather late to be effective, since the child has been under the influence of faulty metabolism for many months before birth (8). More recent experience with early intervention programs, however, leaves this conclusion open to debate.

As Smith has pointed out, if we are to know what form of education is most suitable for the child with Down's Syndrome, educators will have to give recognition to the variables in the physical and mental abilities and disabilities that exist in this syndrome to properly evaluate their programs (9). Possibly, one of the deficiencies in education programs is an inadequate definition of the purpose for which these children are being educated. Now that Down's Syndrome individuals are surviving into the later decades of life, we will need to have a more global view of these individuals and not limit their expectations to the years six through 18.

Smith urges that the social changes rapidly occurring in the families of Down's children and in the communitites in which they live, also be examined. These increasingly favorable attitudes towards Down's and other handicapped individuals, which encourage parents and siblings to treat the Down's child as just another family member, have given these individuals a new self-identity and self-assurance. Similarly, favorable social changes are occurring in most communitites which are opening up new avenues of social and vocational participation. These and other factors, which are evidenced by the recent passage of national and state legislation referenced above, could have a marked stimulating and gratifying effect of Down's Syndrome individuals.

It was believed that Down's Syndrome individuals' intelligence potential fell into the I.Q. range of 25-49 (9). Rynders and others, however, have reviewed studies of the educability of Down's Syndrome children, and conclude that traditional estimates of the Down's Syndrome individuals' I.Q. potential may be grossly inaccurate (7). They point to the fact that studies in the past ten years reporting the educational development of Down's Syndrome persons often have had methodological flaws. Even if corrected for methodological shortcomings, such educability estimates, they assert, may still be too low because until recently, Down's Syndrome children were given no early education that might have enhanced their abilities.

Down's Syndrome is the most common of all types of congenital retardation. Approximately 7,000 diagnosed cases are born in the USA each year. It is only recently that the life span of the Down's Syndrome individual has begun to approach that of a normal individual. In the past, the high incidence of congenital heart defects in these infants and their susceptibility to infection led to an inordinately high death rate. With advances in surgical techniques, many such defects now are correctable. No child, however, is given an active training program involving gross motor activities unless s/he is physically capable of participating in the activities involved.

It is now understood that the Down's child needs more, not less, stimulation than a normal child. He or she needs to hear music and voices, to be played with in a constructive manner, and to be valued by all members of the family. In all of the various early childhood programs attempted during the past decade, there seems to be a consistent finding that without family involvement, the gains a child may make soon disappear when the formal program ends (1).

The child with Down's Syndrome frequently starts life with already inefficient or even distorted movement patterns, such as weak sucking reflexes, insufficient head control with the resultant inability to lift or turn the head and to follow visual and auditory stimuli, and inadequate movements of the trunk and extremities, resulting in faulty feedback of sensory experiences. An increase in sensory-motor input achieved through a carefully structured stimulation program provides additional and stronger stimuli. It elicits more definite responses and raises the level of attentionn, thus motivating the child to repeat successful acts and to derive pleasure from them.

Zausmer has noted that while the normal child does not need extensive instruction as s/he progresses toward more advanced and more complex intellectual goals, the child with lower physical and mental potentials

seems to have a somewhat different pattern of learning (3). The Down's Syndrome child, she maintains, is more apt to make a generalized response, to find it difficult to inhibit inappropriate responses, and particularly, to maintain adequate attention. Learning material, therefore, is broken down into smaller segments. Undesirable patterns of motor and other behaviors are modified while the child is very young and the various systems are still flexible enough to allow for changes more readily than would be possible at a later stage of development.

Since Down's Syndrome children, in general, develop the same behaviors as other children but more slowly, the goal of most training activities is to keep the infants as close as possible to normal developmental rates. Normal developmental milestones are chosen, therefore, as teaching objectives. Strategies used to teach these objectives usually are of two types: consequences and prompting or cueing. Consequences which reinforce desired behaviors may include social reinforcers such as verbal praise, physical contact such as hugging or stroking, and expressions such as smiling, nodding, or clapping the hands. Tangible reinforcers such as food, or the baby bottle, also are used. Inappropriate behaviors are either ignored or discouraged by scolding. Punishments are not usually employed, however.

Prompting or giving a cue to get the infant to respond or behave in a certain way may either be verbal, such as "Mary, come here," or "John, stand up," or physical, such as physically rolling the child over or touching the child's arm to assist in placing an object in a container. Most training activities in the MCPS Parent-Infant Early Intervention Program make use of both verbal and physical prompts. Typically, the physical prompts are gradually removed until just a verbal prompt or cue is given. By using the verbal cue with the physical cue, children also are helped to understand verbal commands.

Ideally, it is preferable that many of the child's behaviors come as responses to his/her physical environment without the necessity for verbal and physical cues provided by other persons. For example, it is important that a child learn to walk to reach an item s/he wants, not only in response to the parent or teacher's verbal cue, "Walk."

Before employing these strategies, each desired behavior or developmental task is analyzed or broken into small steps. While all areas of development are observed and attended to at the same time, those behaviors in which each infant is most delayed are emphasized. Parents are encouraged

to utilize routine activities such as cleaning the house, putting on one's clothes, and eating as opportunities to work with their child. A minimum of four to five such training sessions per day is encouraged.

The behaviors usually expected of infants between birth and 24 morths of age form the basis of all training activities. The components of this training usually involve visual, auditory, oral, and kinesthetic stimulation. Information on these developmental milestones, examples of which are listed in chronologically ascending order, is taken from a variety of sources, including: Bayley Scales of Infant Development (Bayley, 1969), Denver Developmental Screening Test (Frankenburg and Dodds, 1969), and Early Intervention Developmental Profile (Rogers, et al.).

Gross Motor

- holds head steady when carried
- sits with minimum of support
- raises self to sitting position from stomach
- seats self in small chair
- stands with minimum of support
- walks with support

Fine Motor

- visually follows object, 90^{0} angle
- reaches for object
- removes object from cup
- turns pages two or three at a time
- lifts lid off box

Communication - Speech and Language

- turns toward sound
- expresses wants without crying
- points to named picture

Social and Self-Help

- smiles at mirror image
- plays pat-a-cake
- drinks from cup being held
- removes simple garment
- washes and dries hands with help

Gross motor activities focus on large muscle movements, and include head control, sitting activities, rolling, crawling, standing, walking, kicking and jumping, and throwing. Because many Down's Syndrome babies are hypotonic (have poor muscle tone) when they are born, these activities are emphasized in most training programs. More complex behaviors such as crawling and walking develop from earlier behaviors such as good head control for crawling,and trunk control and weight bearing on legs for walking. All kinds of movement, such as bouncing them on your knees, fast rolling from side to side on a bed, and tickling (to make the child's stomach muscles tighten up) are helpful for improving tone.

During the first few weeks of life, movements of the head are encouraged -- first, through stimulation of sucking reflexes, followed by various changes in body positions which bring into play reflexive movements of the head and trunk, and necessitate the use of anti-gravity musculature. During waking hours the infant frequently is held suspended horizontally and vertically and is tilted in a variety of directions. These activities help with equilibrium,and exercise muscle groups which otherwise would remain inactive. Also during this time, guided movements combined with visual, tactile, and auditory stimuli help the infant associate such movements with sensory, pleasant experiences which s/he is apt to choose as a model for more active, spontaneous participation.

Fine motor behaviors include visual following, reaching and grasping, object manipulation, and problem solving skills. These activities focus on the child's use of the hands and fingers to manipulate objects. Many of the "cognitive" behaviors of infants include the manipulation of objects in problem solving and exploration of the environment, such as visual tracking.

Communication includes the abilities to talk and convey meaning non-verbally and to understand and respond to the environment. It is divided into three categories: auditory response, or reaction to sounds; expressive language,or the use of sounds, words, and gestures to communicate meaning;

and receptive language, or the ability to understand and respond to input. Parents are encouraged to engage in face-to-face interactions or conversations with the child, continually labeling objects as they talk: "This is your nose," and "This is cold," and "This is hot." Expressive language, in particular, often is an area of significant delay for Down's infants. The children also are watched closely for problems with their hearing.

Self-help skills refer to the child's ability to feed, dress, and toilet for him/herself. Social behaviors are the child's reactions to self and others and his/her interest in play materials. Development in this area is particularly important if the child is to approximate a normal life. Benda reports that often Down's Syndrome children received less attention and stimulation from parents because of the infant's tranquil disposition and the fact that s/he often was content to simply sit or lie quietly by him/herself for hour after hour (8).

While we cannot claim any statistically supported success for our early intervention program which began four years ago, our experiences have been positive. We have observed that with early stimulation and training, Down's Syndrome infants' sensory-motor, social, and communication development can be influenced. As was expected, we have found a wide range in functional levels and developmental rates among our Down's Syndrome children. None, however, has been found to fit the old stereotypes

of a child with such severe limitations that s/he cannot learn.

With regard to our program goals for parents, it is apparent that we have provided a great deal of support for parents and have maximized their ability to cope with the problems of having a handicapped person as a family member. All parents who have stayed with the program acquired an acceptable level of skill in training their child. More importantly, it is apparent, the children of such parents have a happier start in life.

HEARING IMPAIRMENT PROGRAM

During the seven years the Montgomery County Public Schools (MCPS) Program for the Hearing Impaired has been in operation, it has been our experience that without early language stimulation, the hearing impaired child's educational prognosis is irreversibly impaired. Our main goals, therefore, are to help the hearing impaired infant begin to use what hearing s/he has; to obtain appropriate amplification for the child as soon as possible, and to help the child to begin to develop language. Here, too, we are concerned with guiding and teaching parents to help with their child's special need for auditory and language stimulation.

Of the 55 hearing impaired infants, birth to 36 months, with whom we have worked over the last seven years, most have had additional handicaps. None of the infants was subsequently shown to be totally deaf, however (i.e., if we define "deaf" to mean insufficient residual hearing to learn or understand the spoken word even with the use of a hearing aid).

As in the case of the infant with Down's Syndrome, the education of the hearing impaired infant and his/her parents schould begin immediately upon diagnosis of a hearing loss and should include:

1. emphasis on early and functional use of residual hearing;
2. counseling and guidance for the infant's family so that they are an integral part of the educational program; and
3. an understanding of teaching based on the prime importance of language development for the young child.

The most common second handicap found among hearing impaired children is language disability. The incidence of severe language (and learning) disorders in this group is very high, regardless of the medium of communication used. Other common types of handicapping conditions found oftentimes in the hearing impaired child are problems with visual acuity, perception and function, various types of behavior problems, such as emotional disturbance or hyperactivity, and to a lesser degree,

problems of mental retardation. Isolation for his/her environment and withdrawal oftentimes gives the hearing impaired child the appearance of being retarded.

Significant impairments of hearing fall into basically four categories: 1) conductive hearing loss, 2) sensorineural hearing loss, 3) mixed hearing loss, and 4) central hearing loss(10).

Conductive hearing loss involves impairment of that part of the ear responsible for the mechanical transmission of sound. Therefore, the child experiences a loss of auditory sensitivity. However, when speech materials are made sufficiently intense to overcome the loss, discrimination is not impaired. This type of loss is limited to the outer and middle ear. Most cases of conductive hearing impairment in the outer ear tend to be temporary, and can be resolved by medical treatment.

Sensorineural hearing impairment is a result of damage to the inner ear and its associated nerve fibers. Lesions in the inner ear are usually permanent, involving reduction in auditory sensitivity and a distortion of sound. The child is faced not only with a reduction of sensitivity, but an inability to discriminate the differences between sounds once they

are perceived. The extent of the sensorineural hearing impairment (in terms of the numbers of decibels of loss and the shape of the loss) is directly related to the loss in discrimination ability.

The few types of sensorienural hearing loss which can be corrected are those related to certain drugs and temporary interruption of the blood supply. Sensorineural hearing loss may be congenital, or it may have an onset after birth. Genetic defects, viral infections, bacterials infections, drugs, and high intensity noise are the primary causes of sensorineural hearing loss in children.

The primary effect of sensorineural hearing impairment is on the development of speech and language when the loss is congenital. Unfortunately, making sound louder or more audible for the child does not always make it clearer or more intelligible. This is where the importance of an early intervention program comes in. A tremendous amount of work must be done to help infants interpret sounds and associate those sounds with objects of activities.

Mixed hearing impairment involves lesions in both the inner ear and the middle or outer ear. It is not uncommon for children with senorineural hearing impairment to acquire an ear infection which gives them

a temporary mixed hearing impairment. The ability of the child to discriminate speech will only be as good as the amount of sensorineural hearing present.

Central auditory hearing losses are much more difficult to define in children. Because there are many pathways for a simple auditory signal to reach the cortex, speech materials are commonly used for the diagnosis of central auditory pathology.

The most acceptable diagnostic test requires the child to make a verbal response, which can be judged as correct or incorrect by the audiologist. Since an infant is not able to make a verbal response, most audiological assessments of infants are merely estimates, and audiograms and other kinds of audiological assessments must repeatedly be taken as the infant gets older to be sure that we have a more accurate assessment of the child's condition.

The primary effect of conductive hearing impairment is on the general health of a child - his attention to speech and disturbances of behavior, such as short attention span. The primary effects of a sensorineural hearing impairment are on speech and language developments, which are

prerequisite to the development of normal social behavior and academic learning. The literature and the experience of many clinicians in the field indicate that children with central auditory disorders behave in a manner similar to children with sensorineural hearing impairment.

Audiological evaluations are designed to evaluate the sensitivity, discrimination, and integration abilities of the individual. Tolerance is evaluated only in cases where the child may be abnormally sensitive to intense sound as a function of the type of hearing loss. A thorough evaluation will define the type of loss, the mangitude or degree of loss, the slope or pattern of hearing loss, and recommendations for medical and/or educational remediation.

Between the ages of birth and five months, the audiologist is dependent on reflex audiometry, and orienting responses to sound to establish the presence or absence of a hearing impairment. Responses are obtained using various types of intense noises, tones, or noise makers. Measurements obtained refer only to a generalized response to sound, and do not define the actual sensitivity of the ear in such young children. Orienting responses are defined as eye-widening, eye-turning, and body positioning toward the source of the sound. Recent studies have

questioned the reliability of these observations, when several judges were asked to record the same behavior in a single child (10).

At approximately five months of age, the child begins to develop localization skills. Localization is the ability of the child to locate the source of a sound in a sound field. Be definition, the child must turn his head toward the source of a sound. This head-turning is more definitive than simple orienting responses, and allows for systematic reinforcement of the child's behavior.

With young children, or multiply handicapped children, localization of sound sources can be critical in an audiological diagnosis. However, the young multiply handicapped child may show significant developmental delay. Without sufficient head control, localization audiometry is not possible. Rather than requiring localization of the young handicapped child, frequently a lateralization task is utilized. Ear phones are placed on the child, and changes in behavior are observed as the child is stimulated in both the right and left ear.

One of the most exciting procedures for the evaluation for the difficult-to-test child has been a procedure for operant audiometry which uses a

systematic reinforcement of auditory responses. Primary reinforcers (for example, food) are used to establish, maintain, or modify responses to sound, whereas mild punishment like time-out, is used to control false responses. Operant procedures are extremely effective with the multiply handicapped child, but generally require a continuing access to the child because of the time required to condition the child.

In summary, two basic conclusions can be drawn from the preceding discussion of the state of the art of audiological evaluation in children. 1) The infant and the multiply handicapped older child may require diagnostic sessions over a period of weeks or months before definitive test results can be obtained. 2) Audiologists are much better at assessing the integrity of the peripheral and central systems when the patient is capable of normal speech and language which can be used in testing. Unfortunately, speech and language skills are absent in the very young, or the multiply handicapped older child, particularly if no treatment intervention has taken place.

Many clinical audiologists avoid the multiply handicapped or very young child because of the amount of time and effort necessary for adequate evaluation. Even when they give the amount of time necessary for an adequate evaluation of these children, the results may only be

tentative. Unfortunately, audiologists often do not make use of behavioral data collected by the educational specialists dealing with the young child. It is relatively simple to identify desirable auditory behaviors and to establish the rate at which the child makes these responses under a variety of conditions. Finding effective reinforcement and systematic modification of the child's behavior is primarily an educational problem, but if the behavior to be modified relates to the child's auditory responses, the audiologist can use the data to validate his/her own laboratory test results. This data-based approach is probably the most reliable way to establish the validity of the audiological diagnosis.

Usually, when the child comes to the program, an assessment has been done by an audiologist, and usually a hearing aid has been recommended. The program staff have a number of different types of hearing aids available for loan, and these different types are tried out on the child and observed over a period of time by the parent and by the teacher until the particular type of hearing aid which is best for that child is found. The hearing aid is assessed not only with regard to the level and type of hardware, but also with regard to the level and type of performance. It is an ongoing diagnosis and feedback system among the educator, the parents, and the audiologist.

Since the initial audiological assessment of a young child often results in an audiogram which does not accurately reflect auditory sensitivity because the young child's response to sound is limited by a short attention span and a high degree of distractibility, early childhood testing is very difficult. In the hearing impaired child, the problem is compounded by a lack of awareness of sound as meaningful. Therefore, no interpretation of audiological test data should be considered definitive without a period of ongoing evaluation. This ongoing evaluation provides an opportunity for observation of the child, with and without amplification for informal testing, and for familiarizing the child with clinical testing procedures, as well as for the development of basic listening skills.

The educational audiologist and the teacher in the early stimulation program both work together in the selection of a hearing aid, which is a critical activity involving complex observations and decision-making. The role of the audiologist in the educational setting is crucial, since formal testing cannot be accomplished. Successful selection of amplification and any adjustment thereto must be made largely, therefore, on the basis of a period of careful observation and auditory training during a trial use of a hearing aid. This activity is one of the most important initial activities in the parent-infant program. Indeed, responses during this

period are usually more accurate indicators of the benefit that the child derives from the hearing aid than any information that is obtained in a formal, clinical setting.

The parent-infant program tries, where possible, to have a hearing aid tried out on a child before the age of one, or as early as possible. Evidence of hearing loss, of course, is based on a case history, observation, and evaluation of responses to testing stimuli, and is often, at best, only approximate information about the degreee, the configuration, and the status of each ear. However, as has been pointed out, either we fit a hearing aid with only approximate information, or we lose much valuable time while we try to establish fairly precise thresholds.

Since scheduling constraints or the lack of specific data sometimes cause clinics or private physicians to wait a long period of time before fitting a hearing aid on a young child, the MCPS audiologist, in cooperation with the clinic or evaluating agency, often tries to arrange for the child to use a loaner hearing aid from the program. The child's family, of course, must be aware of the importance of fitting a hearing aid at the earliest possible age, and part of MCPS' attempt or intention is to also make the family aware of what their responsibilities are in the ongoing evaluation process.

Parents are told of the importance of exploiting the speech and language readiness period, and of the possible effects of sensory deprivation if auditory stimulation is not provided at an early age. The information acquired during a trial period and during subsequent audiological follow-ups, becomes the basis of the selection of appropriate aid modifications.

Subsequent to the selection of appropriate amplification, systematic behavioral observation of a child's response to sound must continue. Only through ongoing appraisal are staff members able to determine whether or not the child is progressing according to the set objectives. It serves as a constant reassessment of the child's education potential and is a check on the effectiveness of the aural habilitation program as well. If ongoing evaluation is not an integral part of the early intervention program, it is impossible to propose future educational goals, since there is no foundation defining the child's capabilities.

By about one year of age, the normally hearing child will say his or her first word. At four years of age, the child will have developed grammatical speech. In this short period, the foundation will have been laid for adult language patterns and the child will continue to develop vocabulary and

abstractions which will be fit into the existing patterns. Thus, these early years represent the most critical period for developing speech and language. If maximum development in a hearing impaired youngster is to be achieved, training must begin during these early years. The longer the delay, the more difficult it is for the child to develop the normal patterns of speech and language. Early training should be focused on audition-listening skills, therefore, since language seems to be normally developed through hearing. Most deaf children have usuable residual hearing. Despite indications of a profound hearing loss, the threshold is sometimes a deceptive indicator of a child's ability to profit from residual hearing. Even with a profound hearing loss, duration, rhythm, intonation, and stress of speech can be perceived. Through early auditory training, reception of the most limited sound stimuli may be meaningful.

In designing an auditory training program, guidelines which follow the development of auditory functioning in the normally hearing child are adhered to. Our feeling is that failure to do this precludes the intact development of the child's total communicative capacity. There are two basic components in developing an auditory function: Initially, an awareness of sound must be developed. The environment bombards the young hearing impaired child with sounds that were once inaudible, or extremely

soft. Consequently, amplified sounds may be loud and frightening. The child must be taught to make use of these sounds. In doing so, the infant is provided with specific information about his or her environment. The second step is the development of listening as an integral part of the child's behavior. Once the listening attitude is established, the hearing impaired child must be taught sound discrimination skills, which will enable him not only to differentiate between stimuli, but also to recognize primary sound signals in the presence of competing sounds.

As with the treatment of Down's Syndrome children, specific skill development objectives are tied to an assessment of the child's development vis-a-vis the stages of normal child development. At the completion of the pretesting period, specific educational objectives for each child are determined in each of the skill areas alluded to in the first part of this paper. These objectives are discussed with or, if possible, arrived at in collaboration with the child's parents. At periodic intervals, perhaps monthly or every six weeks, the child's attainment or lack of attainment is noted and objectives and strategies modified accordingly. The emphasis in working with the hearing impaired child, however, is always on the listening, language, and speech skills.

In order for a child to acquire normal language, the child must become "auditory minded." His or her attention must constantly be directed to the sounds around him/her. The goal here is to get the child to listen

constantly -- to use what hearing s/he has. This involves having the child listen to sounds and make an association between the sound and an activity or object. The parent must assume a helping role in getting the child to assign meanings to the sounds around him or her. The objectives for the development of listening skills are presented sequentially from the early auditory awareness of environmental sounds, to the auditory processing of increasingly more complex language segments.

Language development involves a complex integration of auditory, cognitive, and speech motor processes. It is receptive, integrated, and expressive in form. Normally hearing infants acquire language in a seemingly effortless manner through common, everyday experiences. For the hearing impaired child, the process of language development should be as natural and family-related as possible. It is only through hearing normal language patterns that the child ultimately will be able to comprehend and generate an infinite number of sentences from the infinite rule system of a language. The parents, helped by specific suggestions and guidance from the teacher, as needed, provide the primary language input. The parent must include the child in the daily household routines, since most activity is home and family-centered in the early years. The goal is for the parent to habitually engage in purposeful talking corresponding

to the situation at hand. Later, when the child begins to express thoughts, the parent will also expand the child's utterances.

The production of speech involves the auditory system, along with intact physiological functioning and accurate perceptual ability. As a general rule, the hearing impaired child will vocalize to express feelings and wants and will derive some pleasure and sensation from the kinesthetic feedback received. Within the oral structure or cavity, these vocalizations may soon decrease, however, if the child has not received the auditory feedback that is needed. A decrease in the amount of vocalization consequently results in a decrease in the neuromuscular patterning which will interfere with the hearing impaired child's development of an appropriate kinesthetic feedback system (10).

The hearing impaired child, prior to amplification, does not receive the speech of others and thus does not develop an auditory sense for the rhythms, stress, tone, and accents of language. Early intervention is necessary to aid the child in the "normal" development of intelligible speech and the acquisition of the prosodic elements of the language. A kinesthetic feedback system should be stimulated so that as a child develops language, his or her speech production will be intelligible and

as close to normal in pitch and inflection as possible. The developmental sequence of speech objectives is closely related to the sequence of objectives for stimulating receptive and expressive language development. Many of these skills will be developed simultaneously, rather than in noticeably discreet stages.

All lesson activities, from the very beginning up through the elementary grades, must stress participation by the child. The children must have something to do with their hands, such as clap to music or match objects. Every lesson must conclude with an observable indication that the child feels good about what s/he has done, and that s/he knows that s/he has performed in an effective manner. Praise by the teacher and the parent, indicated by smiling, approval of the child's efforts, and even by their applauding, are essential in this need to let the child know that s/he is an effective human being.

In general, MCPS' programs for hearing impaired children stress the use of hearing for communication purposes and the development of oral speech and language. Primary emphasis in these programs is on speech reading, auditory training, and speech and language development through an auditory mode, particularly for the infant. Where this is not feasible, and where parent preference is otherwise, particularly for older children, other approaches are also taught. For example, manual programs utilizing sign language and finger spelling, and total communication programs which

utilize all possible modes of communication, oral and manual, also are available. Our preference, however, is to help children who are able, to develop oral language skills from infancy and be educated for total integration within a hearing society.

The evaluation of such a small and complex program as the parent-infant programs for hearing impaired and other handicapped children is very difficult. Each child is unique. The effect of the impairment on each child's intellectual, social, emotional, and even spiritual dimension, is idiosycratic. Because such programs are relatively new, little information is available on what can be expected. Lack of norms and scarcity of measurement instruments designed for this type of handicap add to the problem.

Nevertheless, it is the philosophy of this program that a child will learn if he is taught, and that those children who are not taught or stimulated as infants will be that much further retarded in their development when they finally reach school age, and that many times, they will never catch up and exercise the potential that they have. This has been observed to be true not only with regard to academic achievement, language acquisition, self-image and social skills, but also with regard to the level of hearing.

REFERENCES

1. HANSON, M.J.: Teaching Your Down's Syndrome Infant, A Guide for Parents. Baltimore: University Park Press, 1977.

2. VANDER VEER, B. and SCHWEID, E.: Infant Assessment: Stability of Mental Functioning in Young Retarded Children. American Journal of Mental Deficiency, 79: 1-4; 1974.

3. ZAUSMER, E.: Principles and Methods of Early Intervention. Down's Syndrome [Mongolism], Research, Prevention, and Management. Koch, Richard and de la Cruz, Felix (Eds.). New York: Brunner/Mazel Publishers, 1975.

4. BARNARD, K.: Infant Stimulation. Down's Syndrome [Mongolism], Research, Prevention, and Management. Koch, Richard and de la Cruz, Felix (Eds.). New York: Brunner/Mazel Publishers, 1975.

5. PUESCHEL, S.M.: Theoretical Concepts of Early Intervention. Down's Syndrome [Mongolism], Research, Prevention, and Management. Koch, Richard and de la Cruz, Felix (Eds.). New York: Brunner/Mazel Publishers, 1975.

6. DREZEK, W.: Three Infants: Case Studies of Children in the Infant-Parent Training Program. Presented at the annual convention of the Council for Exceptional Children. Atlanta, Ga.: April 11-15, 1977.

7. RYNDERS, J. et.al.: Underestimating the Educability of Down's Syndrome Children: Examination of Methodological Problems in Recent Literature. American Journal of Mental Deficiency, 82: 440-448, 1978.

8. BENDA, C.E.: The Child with Mongolism (Congenital Acromicria). New York: Greene and Stratton, 1960.

9. SMITH, G.F.: Present Approaches to Therapy in Down's Syndrome. Down's Syndrome [Mongolism], Research, Prevention, and Management. Koch, Richard and de la Cruz, Felix (Eds.). New York: Brunner/Mazel Publishers, 1975.

10. SMITH, K.E.: Audiology. Developmental Disorders: Assessment, Treatment, Education. Johnston, Robert and Magrab, Phyllis (Eds.). Baltimore: University Park Press, 1976.